

## Triangle Angle Relations

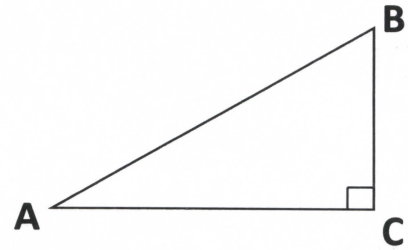
Which side is the **HYPOTENUSE**? AB

Which side is **OPPOSITE** from angle A? BC

Which side is **ADJACENT** to angle A? AC

Which side is **OPPOSITE** from angle B? AC

Which side is **ADJACENT** to angle B? BC



### INVESTIGATION:

1. Draw a vertical line **anywhere you want** along angle A (use a protractor to make sure you have a 90-degree angle at the bottom!). Your triangle should be a different size than other students.
2. Label the right angle with a "C" and the top vertex of your triangle with a "B" – it should be labeled just like the triangle at the top of this page.
3. Use a protractor and ruler to find the following measurements for your triangle:

$m\angle A = \underline{30^\circ}$

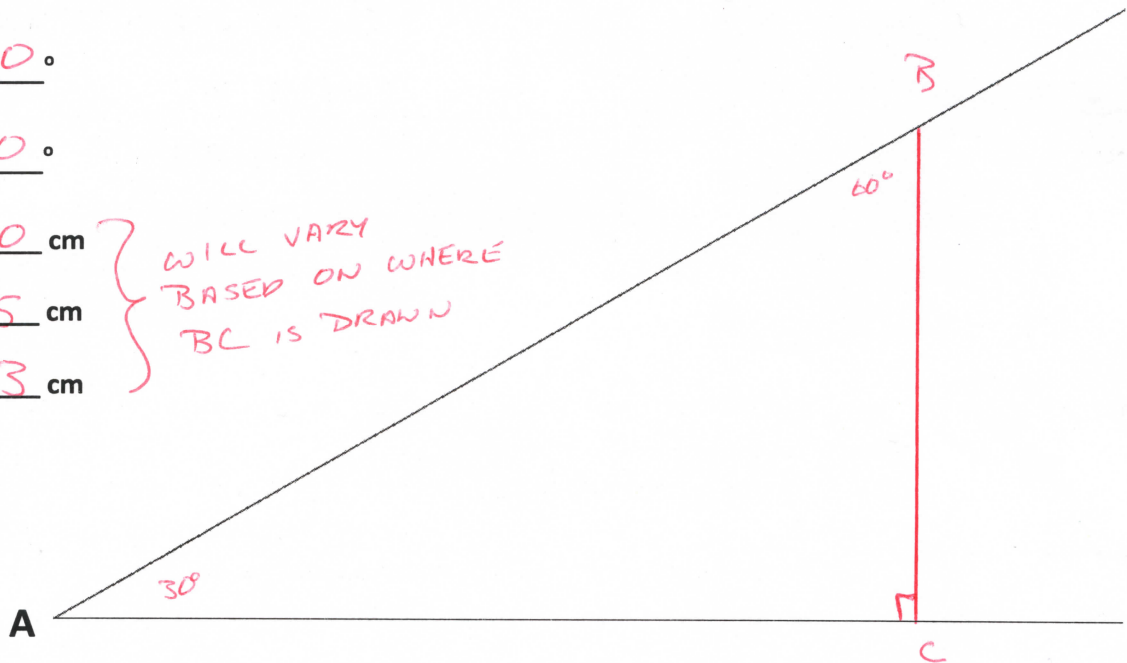
$m\angle B = \underline{60^\circ}$

$AB = \underline{13.0} \text{ cm}$

$BC = \underline{6.5} \text{ cm}$

$AC = \underline{11.3} \text{ cm}$

} WILL VARY  
BASED ON WHERE  
BC IS DRAWN



4. Now we will form **RATIOS** of sides. Divide on your calculator and round to two decimal places.

From  $\angle A$ :  $\frac{\text{opposite side}}{\text{hypotenuse}} = \frac{6.5}{13.0} = \frac{1}{2} = .50$        $\frac{\text{adjacent side}}{\text{hypotenuse}} = \frac{11.3}{13.0} = .87$        $\frac{\text{opposite side}}{\text{adjacent side}} = \frac{6.5}{11.3} = .58$

From  $\angle B$ :  $\frac{\text{opposite side}}{\text{hypotenuse}} = \frac{11.3}{13.0} = .87$        $\frac{\text{adjacent side}}{\text{hypotenuse}} = \frac{6.5}{13.0} = .50$        $\frac{\text{opposite side}}{\text{adjacent side}} = \frac{11.3}{6.5} = 1.73$

5. Compare answers with classmates around you!

a. What do you notice about the ANGLE measures of your triangles?

*all 30-60-90*

b. What do you notice about the SIDE lengths of your triangles?

*all different*

c. What do you notice about the RATIOS of side lengths you calculated above?

*same*

6. Is there a geometric concept we can use to explain why this is true?

*similar  $\Delta$ s*